AMENDMENTS TO THE SPECIFICATION

Please amend the specification as follows:

Please replace paragraph [088] with the following amended text:

[0088] FIG. 10 is a functional block diagram of a circuit implementation of the IO neuron model described above. The circuit comprises a first spike generator 21, a sinusoidal generator 22, a filter 23 and a second spike generator 24. Inputs are included to control the amplitude of signals generated by the first spike generator [23] 21, the frequency of the sinusoidal signal generated by the sinusoidal generator 22 and the spiking threshold of the second spike generator 24. A first output is provided at the output of the filter 23 and a second output is provided at the output of the second spike generator 24. The various blocks and signals will now be described in greater detail with reference to an actual circuit implementation.

Please replace paragraph [0078] with the following amended text:

[0078] With a suitable choice of parameter values, it is possible to obtain qualitatively similar membrane potential behavior as that observed experimentally. FIG. 5A shows the output of the model 10 exhibiting the spiking that occurs when the membrane of the IO neuron is depolarized to the point at which the threshold for spiking is met. FIG. ~~51~~5B shows the same output in phase space. In this exemplary case, the parameter values are I.sub.1=1.68 and I.sub.2=-0.65. The spiking is generated by the high-threshold pulse generator 12 and mimics the behavior that is associated with sodium (Na.sup.+) currents in the IO neuron.

[0163] The modeling of the stochastic oscillations in the first lattice 2110 for different values of ~~intemeuron~~ interneuron coupling, d, and the response of the slaved lattice to such activation will now be described. Clearly, for small intensity levels, the noise is able to excite only low amplitude oscillation. In the limit of fully uncoupled neurons, i.e., d=0, Eq. 10 yields n.times.n independent stochastic differential equations:

$$x''_{jk} + 2\,\gamma x_{jk} + \Omega^2{}_0 x_{jk} = -\,w_0 \sqrt{2D}\,\xi_{jk} \qquad \textbf{(18)}$$

[0216] The computing power of the UCS of the present invention is substantially greater than can be implemented with a digital computer. In contrast to existing controllers (mostly based on digital computing systems) the UCS of the present invention does not operate numerically but rather works by internally emulating a large set of possible solutions to a given task. Given N parameters to be controlled, the UCS would include at least the same number of processing units; i.e., ~~an~~ a processing unit is provided for each parameter.